

REMARKS

Claims 1-50 are pending in the application. Claims 51-126 have been cancelled without prejudice. Claim 22 was objected to because of several informalities. Claims 1-50 were rejected under 35 U.S.C. §112, second paragraph, as failing to point out and distinctly claim the subject matter that the Applicant claims as the invention. Claims 1, 18-21, 26, 27, 33-37 and 40-46 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dawson. Claims 2-11 and 22-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dawson in view of Brewer. Claims 38, 39 and 47-49 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dawson in view of Lin. Claims 12-17, 28-32 and 50 were found to be allowable if rewritten to overcome the rejections under 35 U.S.C. §112 and to include all of the limitations of the base claim and any intervening claims. Claims 1, 7, 9, 10, 12, 17-19, 22, 24, 26, 28, 32, 39, 41, 44, 46 and 50 have been amended, without new matter. Reconsideration and reexamination of the application in view of the amendments and following remarks is respectfully requested.

Claim 22 was objected to because of several informalities. Per the Examiner's suggestion, Claim 22 has been amended to change "stations[s] ... receivable in one of the ports" and similar phraseology to "station[s] ... connectable to one of the ports." With the amendments to claim 22, it is respectfully submitted that the objection to claim 22 has been overcome.

Claims 1-50 were rejected under 35 U.S.C. §112, second paragraph, as failing to point out and distinctly claim the subject matter that the Applicant claims as the invention. In particular, regarding claims 1 and 46, the Examiner stated that it is unclear what "operating status of the system" means. The operating status of the system is a broad term that can represent a number of conditions of the system. For example, corrupted data is described on page 1, line 19. Poorly connected stations are described on page 1, line 35. Data flowing around the loop is described on page 5, lines 25-26. An initialization procedure is described on page 8, line 25. An automatic external loop-back test is described on page 9, line 14. A failed port insert is described on page 9, line 26. Five loop states are described on page 10, lines 10-12, including the states INOPERATIVE, INITIALIZING, OPEN-INIT, UP and UP+FRAME. These are just some of the examples of the operating status of the system. With the operating status defined with the examples provided above,

it is respectfully submitted that the rejection of claims 1-50 under 35 U.S.C. §112, second paragraph has been traversed.

Claims 1, 18-21, 26, 27, 33-37 and 40-46 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dawson. Claim 1 has been amended to make it clear that the arrangement forms a diagnostics loop which is separate from the main loop. Similarly, claim 46 has been amended to make clear that a diagnostics loop, separate from the main loop, is used to monitor the operational status of the main loop. With the amendments to claims 1 and 46, it is respectfully submitted that the rejection of claims 1 and 46 has been overcome.

The present invention is directed to diagnosis and recovery in high performance digital loops such as those in Fibre Channel systems. In such digital loops, a plurality of stations are interconnected within a hub such that digital data flows between the stations in a main loop based on the operational status of the system. An "arrangement" comprised of a fixed diagnostics unit (FDU) and a roving diagnostic unit (RDU) can be selectively connected to different points and ports within the hub and between two stations for monitoring certain characteristics of the data in a way that provides for non-invasive identification of one or more conditions related to the operational status of the system. In one embodiment, an RDU along with one or more port control circuits (PCCs) form part of a diagnostics or inner loop selectively configured such that data flows in the opposite direction of the main loop. The use of a counter-rotating diagnostics loop may be realized by every port containing an RDU/FDU/PCC. Data on the main loop is copied onto the diagnostics loop by one of the PCCs and travels around the diagnostics loop to the RDU in a non-intrusive manner such that operation of the main loop is not affected.

Amended claims 1 and 46 recite a diagnostics loop which is separate from the main loop. Dawson does not disclose, teach or suggest a separate diagnostics loop. All error detection and correction in Dawson occurs through the main loop, and thus Dawson actually teaches away from a separate diagnostics loop.

Furthermore, a careful reading of Dawson reveals that the NMS of Dawson is nothing like the "arrangement" recited in amended claim 1. Amended claim 1 makes clear that the "arrangement" forms part of a diagnostics loop which is separate from the main loop. In contrast, the NMS of Dawson is part of the main loop, coupled into the system as one of several communication stations (see col. 8 lines 29-31 and col. 11 lines 32-34) arranged in a ring (see col. 7 lines 40-42 and FIG. 1).

In addition, Dawson fails to disclose, teach or suggest noninvasive monitoring, as recited in amended claims 1 and 46. Because the NMS of Dawson is one of the communication stations that comprise the ring, the connection of the NMS into the ring modifies the structure of the ring. An invasive or intrusive monitoring device modifies the structure of the loop, and can therefore introduce its own problems and affect the performance of the loop (see page 1, lines 33-39 of the application). Because use of an NMS modifies the structure of the ring and forces data to pass through the NMS, the NMS is an invasive monitoring device.

Amended claim 1 also recites that the arrangement is "selectively connectable at points within the hub," while amended claim 46 recites "monitoring said digital data at a selectable plurality of points distributed within the hub." In contrast, the NMS of Dawson is coupled into the ring at a fixed location. Dawson fails to teach or suggest, and in fact teaches away from an arrangement selectively connectable at points within the hub. In Dawson, NMMs permanently coupled within each concentrator relay loss metric results to an NMS. The NMS is contained in one concentrator 60, where the concentrator provides a hub only for those stations connected to that concentrator in a fixed configuration (see col. 8 lines 6-31 and FIG. 2). The complete loss metric results from each NMM are required to isolate a fault. In other words, Dawson relies on fixed monitoring devices, not selectively connectable devices, to relay information to an NMS to determine the location of a fault. An arrangement selectively connectable at points within a hub would be completely contrary to the teachings of Dawson.

Because Dawson fails to disclose, teach or suggest all of the limitations of amended claims 1 and 46, and in fact teaches away from some limitations, it is submitted that the rejection of

amended claims 1 and 46 under 35 U.S.C. §103(a) as being unpatentable over Dawson has been overcome.

In addition, because claims 18-21, 26, 27, 33-37 and 40-45 depend from claim 1, the rejection of those claims under 35 U.S.C. §103(a) as being unpatentable over Dawson has been overcome for the same reasons provided above with respect to claim 1.

Claims 2-11 and 22-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dawson in view of Brewer. Claims 2-11 and 22-25 depend from claim 1. Dawson has been discussed above with respect to claim 1. Brewer is completely silent with respect to a diagnostics loop separate from a main loop. Brewer contains no disclosure at all related to an arrangement that forms part of a diagnostics loop which is separate from the main loop and is "selectively connectable at points within the hub" that provides for "non-invasive identification of one or more conditions," and in fact teaches away from such an arrangement. Brewer discloses a hub port in a hub of a loop that contains a detection circuit for detecting loop failure initialization data received from its attached node port. Upon detecting the loop failure initialization data, the hub port performs a loop failure initialization sequence, then enters a bypass mode which enables data to bypass the hub port. Each node requires a hub port if the node is to be bypassed upon detection of a failure. Thus, Brewer teaches away from an arrangement selectively connectable at points within the hub.

Because neither Dawson nor Brewer discloses, teaches or suggests all of the limitations of claims 2-11 and 22-25, it is submitted that the rejection of claims 2-11 and 22-25 under 35 U.S.C. §103(a) as being unpatentable over Dawson in view of Brewer has been overcome.

Claims 38, 39 and 47-49 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dawson in view of Lin. Claims 38 and 39 depend from claim 1, and claims 47-49 depend from claim 46. Dawson has been discussed above with respect to claims 1 and 46. Lin fails to disclose, teach or suggest a diagnostics loop separate from a main loop, or an "arrangement" that forms a part of a diagnostics loop. Lin also contains no disclosure at all related to an arrangement "selectively connectable at points within the hub" that provides for "non-invasive identification of one or more

conditions." Lin discloses an implementation of the loop initialization process whereby one or more of the nodes contains a control register having an "autoswap" bit which reduces the retransmission latency of nodes in the loop and reduces the propagation delay of the smallest initialization data frame around the loop. The autoswap bit and associated circuitry of Lin is present in every node, and is therefore not selectively connectable to nodes in the loop. Lin is solely concerned with initialization of the loop, not the identification of one or more conditions.

Because neither Dawson nor Lin discloses, teaches or suggests all of the limitations of claims 38, 39 and 47-49, it is submitted that the rejection of claims 38, 39 and 47-49 under 35 U.S.C. §103(a) as being unpatentable over Dawson in view of Lin has been overcome.

Claims 12-17, 28-32 and 50 were found to be allowable if rewritten to overcome the rejections under 35 U.S.C. §112 and to include all of the limitations of the base claim and any intervening claims. As described above, the rejection of claims 1-50 under 35 U.S.C. §112 has been overcome. Furthermore, claims 12-17 and 28-32 depend from claim 1, claim 50 depends from claim 46, and as described above, the rejections of claims 1 and 50 have been overcome. Therefore, it is respectfully submitted that claims 12-17, 28-32 and 50 are now allowable.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

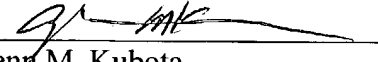
If, for any reason, the Examiner finds the application other than in condition for allowance, Applicants request that the Examiner contact the undersigned attorney at the Los Angeles telephone number (213) 892-5752 to discuss any steps necessary to place the application in condition for allowance.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of

such petitions and/or other fees due in connection with the filing of this document to **Deposit**
Account No. 03-1952 referencing docket no. 491442004600.

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Respectfully submitted,

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